Fisher Labs®

CZ-21 QuickSilver

Deep Search, Land and Underwater, Target I.D. Metal Detector

Operating Manual

FISHER RESEARCH LABS

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ABOUT YOUR DETECTOR

Your CZ-21 QuickSilver is an all-purpose metal detector engineered for land, beach, salt and fresh-water treasure hunters. Here are some important features:

1. **Leakproof:** Submersible to 250 feet.
2. **3-Tone Target I.D.:** A low tone for iron, a mid-tone for pull tabs, foil and most gold rings, and a high tone for U.S. coins, silver rings and some gold rings.
3. **Depth:** Patented Fourier domain signal analysis. *Two* deep-seeking, ground-compensating VLF signals (one at 5 KHz and one at 15 KHz) provide twice as much target information for accurate analysis and identification.
4. **Two Search Modes:** A silent running, slow motion target I.D. mode and a hot, autotune mode for all-metal searching.
5. **VCO No-Motion Pinpointing:** Tap the pinpoint button and the audio tone increases in pitch and volume as the center of the coil approaches the target.
6. **Big-Target Alert:** The CZ-21 circuits may overload on large, shallow targets. A distinctive bell tone immediately warns you that the target is too large to identify.
7. **Faint-Target Audio Boost:** As you increase the volume level past "5", strong target sounds remain at a fixed volume while faint, deep-target sounds continue to get louder.
8. **Quick Manual Ground Balance:** Tap the pinpoint button and lower the coil to the ground. Then set the ground control just below the audio tone and you are precisely tuned for on-site conditions.
9. **Separately Sealed Battery Compartment:** Protects the electronics from accidental flooding.

10. **Search Coils:** The CZ-21 comes with the 8" coil as standard equipment, but can also be custom ordered with the 10" coil. All coils are permanently attached.
11. **Balanced, Comfortable and Hipmountable:** Cushioned arm rest, soft foam grip and a control housing that slips off the handle and onto your belt.
12. **Salt Water Compensation:** Salt water is electrically conductive, and therefore induces a strong signal in the searchcoil. Unlike most other metal detectors, the CZ-21 uses Fourier Domain signal analysis to cancel the salt water signal. Under most conditions you will not experience any false signals from salt water. When working in the surf zone at high sensitivity settings you may hear an occasional "whisper" which is easily ignored.
13. **Easy to Use:** Just pick it up, set the control on the red circles and start searching in a "coins-only" mode. Or for maximum performance, adjust the controls *for your own specific situation.*

Read this instruction manual thoroughly, practice often and you're in for some exciting treasure hunting. Drop us a line if you have any questions, comments or good finds to tell us about. In the meantime . . .

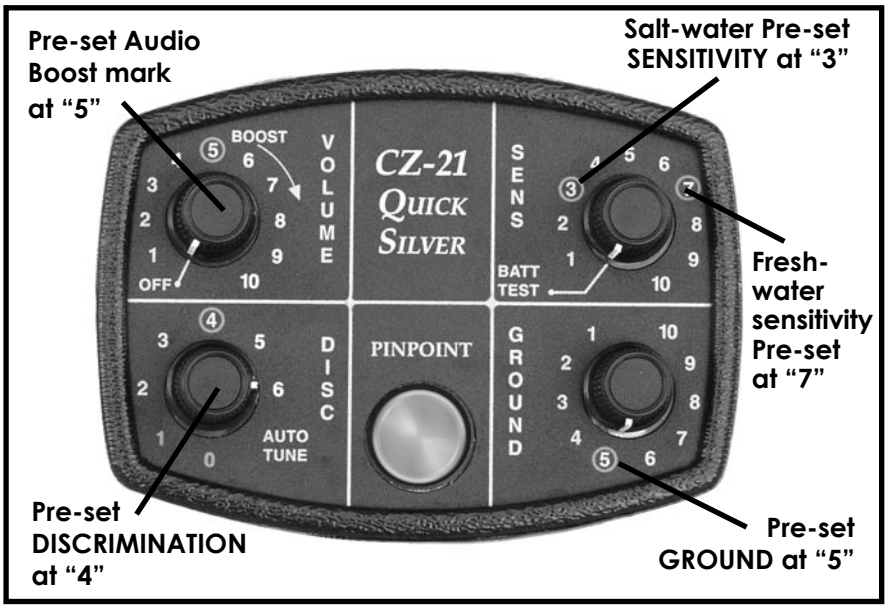
Happy Hunting,
Fisher Research Labs

CONDENSED OPERATING INSTRUCTIONS

Factory Pre-Set "Turn-On-and-Go" Marks

Your CZ-21 QuickSilver is simple to operate. Even so, we strongly recommend that you read this entire manual. You'll be able to tune your CZ-21 to your specific needs and conditions.

Figure 1. Factory pre-set turn-on-and-go marks (circled in red or blue on your CZ-21 control panel) can get you up and running immediately.



1. Set all the controls to the red "Turn-On-and-Go" pre-set:

GROUND = 5
DISC = 4
SENSITIVITY = 3
VOLUME = 5

This puts you in a "coins-only" mode, and you're ready to start searching. Keep in mind that the GROUND setting of "5" is probably not the optimum setting for the ground you're searching. The sensitivity level is set low to reduce false signals caused by ground mineralization.

2. Adjust the volume control for a comfortable volume when the coil is passed over a large, shallow target.

3. Travel slowly, overlap your sweeps and keep the search coil moving. Remember, you're in a "motion" search mode, and the coil must be in motion to detect a target.

4. When you get a good, repeatable signal, pinpoint the target.

Using Headphones

Using headphones (not supplied) improves battery life, and prevents the sounds from annoying bystanders.

It also allows you to hear subtle changes in the sound more clearly, particularly if searching in a noisy location. For safety reasons, do not use headphones near traffic or where other dangers are present. This device is to be used with interconnecting cables/headphone cables shorter than three meters.

ASSEMBLY

Your Fisher CZ-21 requires little assembly. Handle it carefully, care for it regularly, and it will give you years of dependable service.

1. Remove the headphone, handle and search coil assemblies from the box. Be careful not to put any strain on the cable connections.
2. Adjust the lower stem to the approximate length you will be using: extended for stand-up use or as short as possible for diving. To extend the lower stem, push in the spring lock, pull out the lower stem and let the spring lock snap into another hole.
3. Unwind just enough cable to attach the search coil to the lower stem.
4. Remove the bolt and wing nut from the search coil. Line up the hole in the lower stem between the two holes in the search coil "ears." Attach the coil to the stem with the bolt and wing nut and finger tighten.
5. The arm rest may be repositioned for maximum comfort by removing the arm-rest screw, sliding the arm rest to the next screw hole and re-inserting the arm-rest screw.

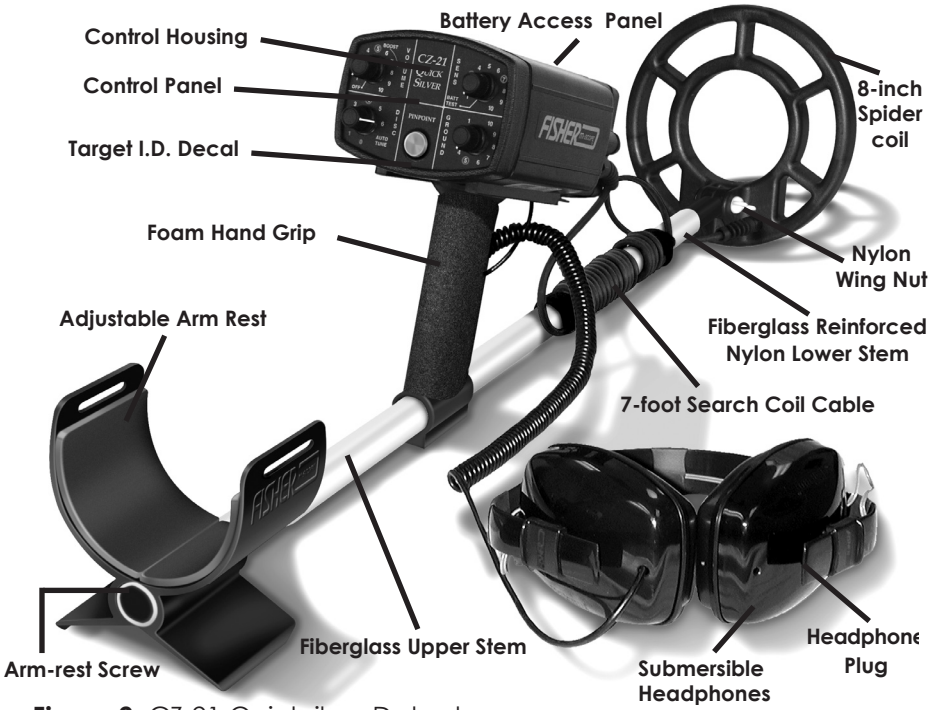


Figure 2. CZ-21 Quicksilver Detector.

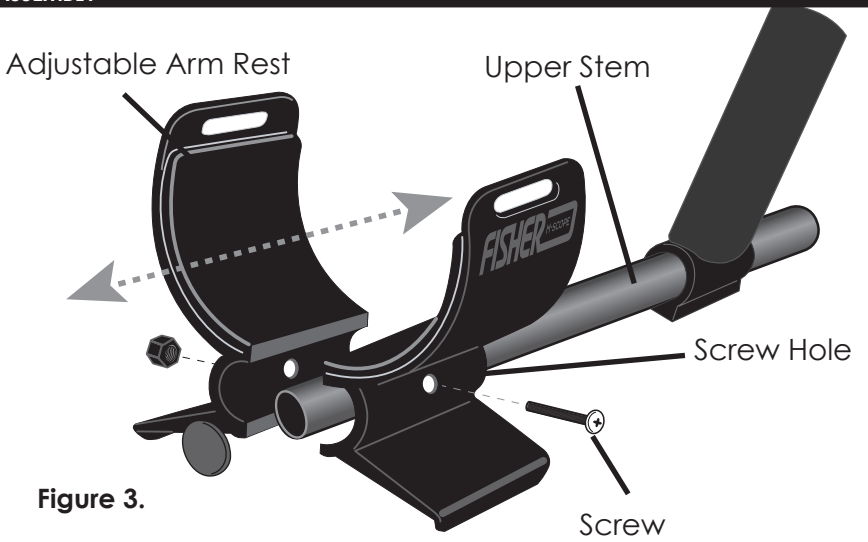


Figure 3.

SETTING UP

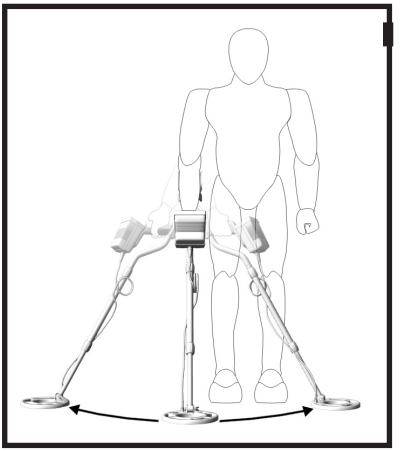


Figure 4.
When searching on land or in shallow water, keep your arm straight and your search coil no more than 2 inches above the ground.

SETTING UP FOR LAND OR SHALLOW WATER

Put the headphones around your neck to keep them out of the way while making the following adjustments:

1. Adjust the stem length and coil angle so the search coil rests flat on the ground about 6 inches in front and slightly to the right of your foot (to the left of your left foot if you're left handed).
2. Leave enough slack in the coil cable to allow the coil to swivel as far as it can in either direction. The coil wing nut should be tight enough to prevent the coil from moving.

3. You should now be able to move into your "search" position by leaning slightly forward and raising the search coil no more than 2 inches above the ground. Your arm should still be straight, and the coil should be parallel to the ground, about 12 inches in front of your foot. The coil angle may have to be slightly readjusted at this point.

SETTING UP FOR DIVING

Unlike most VLF metal detectors, the CZ-21 works well in salt water. This capability, along with its deep-seeking sensitivity, makes it ideal for underwater treasure hunting and wreck diving. The CZ-21 is waterproof to a depth of 250 feet. Remember, always practice safe diving methods.

When diving with your CZ-21, use the shortest stem length possible, with the extra cable wrapped tightly around the stem, as closely as possible to the control housing. Never hipmount your control housing while diving.

1. Adjust the stem length as short as you can without having the search coil detect your diving gear.
2. Adjust the search coil parallel to the sea bed, river or lake bottom.
3. Make sure extra cable is coiled tightly on the upper stem as closely as possible to the control housing, with just enough slack near the search coil to allow it to swivel as far as it can in either direction. Too much loose cable near the search coil may generate false signals.
4. Remove the tethered earphone plugs for rapid pressure equalization as you dive and return to the surface.

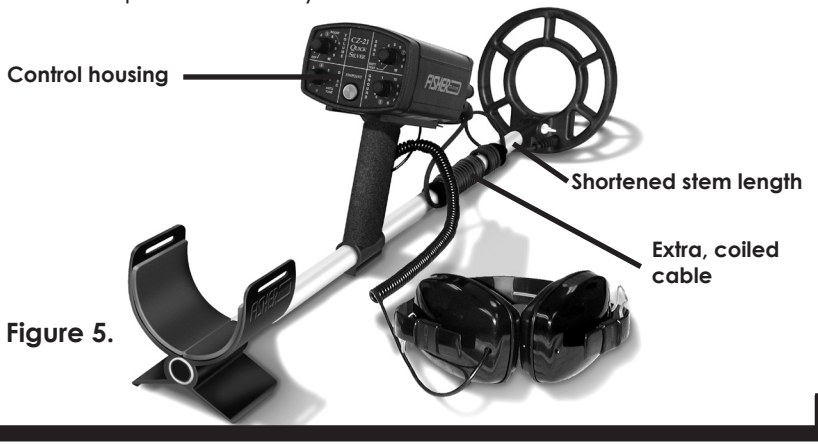


Figure 5.

Caution: *Hipmounting the CZ-21 control housing is not recommended for underwater use. The search coil cable may become entangled with a submerged object, making it difficult for the diver to resurface quickly in case of emergency.*

SETTING UP FOR HIPMOUNTING

For nearly-effortless treasure hunting, the control housing is easily removed from the handle and attached to the belt clip (included).

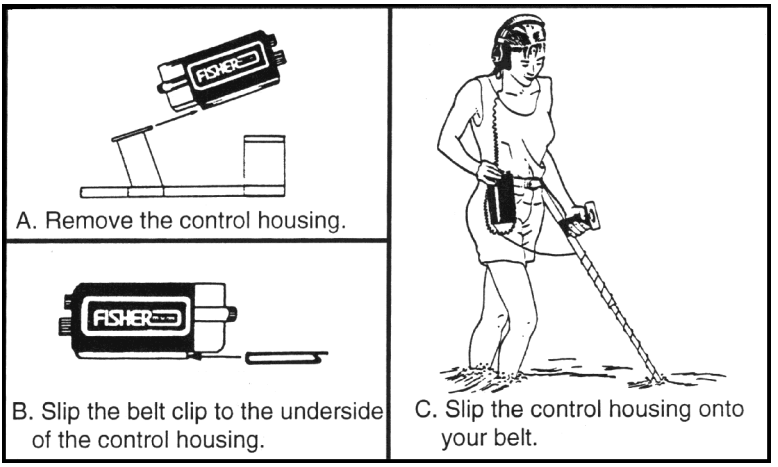
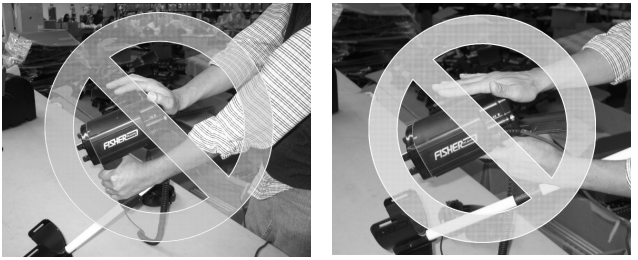

A. Remove the control housing.
B. Slip the belt clip to the underside of the control housing.
C. Slip the control housing onto your belt.

Figure 6. You can hipmount your CZ-21 by sliding the control housing from the handle and attaching it to your belt. This reduces the weight of the stem, creating nearly effortless hunting.

INSTRUCTION FOR REMOVAL OF CZ-21 FROM HANDLE

WARNING DO NOT DO THIS



Do not push on unit from the back (battery side.). Doing this will most likely cause unit to release suddenly and fly off, impacting on the control knobs on the floor, and damaging the unit.
THIS TYPE OF DAMAGE WILL VOID YOUR WARRANTY

Hold unit firmly and separate handle, being careful not to drop the control unit and damage it. Place unit battery side down with battery cover on table top, or a flat stable surface and grasp the unit firmly in one hand and the handle grip firmly in the other.

"Hipmounting" the CZ-21 in this manner takes about half the weight off the handle and allows the land or shallow-water treasure hunter to search much longer without arm fatigue.

1. Slide the belt clip into grooves on the bottom of the control housing. This is a snug fit, and you'll have to bend the clip slightly.
2. Unwrap just enough of the coil cable to allow for searching.
3. Slip the control housing onto your belt, left side for right handers, right side for left handers.

NOTE: *Because of the extreme sensitivity of the CZ-21 search coil, hipmounting the control housing may produce a false signal when the search coil reaches the end of its arc (on the side that the control box is attached to your belt). Depending on your stem length and how high you have the housing hipmounted, the search coil may actually detect the housing.*

WARRANTY NOTICE:

Damage to coil cable at housing connection is not warrantable if damaged by excessive force.
If hipmounting, please leave slack in the cable so as not to yank the cable from the housing at the end of your sweep.

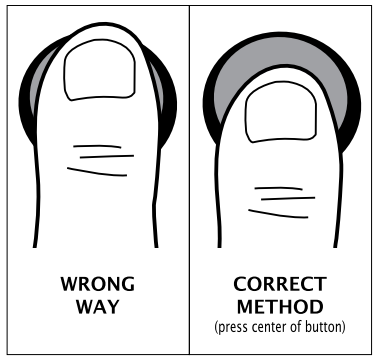
CONTROL PANEL

1. **VOLUME/OFF:** Power on-off and volume control. Volume is gradually increased from 1-5 settings. From 5-10, loud-target response is held constant while faint targets continue to get louder.
2. **DISC:** In the 0-6 positions, the CZ-21 is in the target I.D. mode, which is a silent, no-threshold, motion-discrimination mode of operation with the ability to identify and then ignore ("reject") or accept many kinds of small metal targets. In the AUTOTUNE position, the CZ-21 is in an all-metal mode. In this mode, the CZ-21 has a slightly wider and deeper search pattern, however, it lacks the ability to discriminate or identify and reject targets.
3. **GROUND:** Used to electronically cancel the effects of ground mineralization. Proper use of this control will minimize false ground signals and ensure that the CZ-21 is operating at its maximum potential in just about any ground condition including wet ocean sand.
4. **SENS (Sensitivity)/BATT TEST:**
   SENSITIVITY: The higher the setting, the more sensitive the detector. Start at lower sensitivity setting until you gain experience with the detector. ③ is the suggested default setting for salt water hunting. ⑦ is suggested for fresh water.
   BATT TEST: To test batteries
   1. Reduce volume to low level
   2. Put on headphones
   3. Rotate SENS knob to BATT TEST position
   4. Rotate VOLUME knob to increase volume
   As you rotate to "10" the volume and tone will indicate

Figure 7.
Control Panel

battery strength.
GOOD BATTERIES: Loud, high pitched tone
WEAK BATTERIES: Soft, low pitched tone or "ticking" sound
BATTERIES NEED REPLACING: No tone
During use, the speaker volume will fade and become nearly inaudible before the detector performance is compromised by weak batteries.

5. **PINPOINT:** Activating the PINPOINT feature with the center-positioned button enters a NO-MOTION detection mode. In this mode of operation, the detector will emit a monotone hum whenever metal enters the coil's field of detection. To use pinpoint, PRESS the button. The pinpoint button will not deflect with pressure; you will feel no movement in the button. A 2nd press of the button will return you to your previous motion detection mode.
A moderate pressure, applied briefly to the **center** of the button, is required.
The button requires a 2-second wait between presses.



GROUND BALANCING

When your CZ-21 QuickSilver is properly "ground balanced," it will have only a minimal response to ground mineralization. Precise adjustment of the GROUND control is critical for optimum performance. The higher the degree of ground mineralization or the higher the sensitivity setting, the more critical it is to have your machine properly ground balanced. Once you adjust it in either the Autotune mode or Target-I.D. mode, you can switch back and forth between the two modes without resetting. Recheck your setting occasionally as you search because ground conditions often change rapidly.

If you have difficulty ground balancing, try reducing your sensitivity level or moving to another spot just in case you are over a buried piece of metal. In some areas of high ground mineralization you may not be able to use the touch pad method.

QUICK G.B. METHOD

This will probably be your method of choice in all but the most difficult of ground conditions. It's fast, easy and accurate. You can use this method in either the Autotune or Target-I.D. mode.

1. With GROUND control at "10" hold your search coil 6 to 12 inches off the ground. Make sure you're at least 3 feet away from any metal objects.
2. Tap the PINPOINT button and lower the search coil to the ground. Rotate the GROUND control clockwise until you hear an audio tone. Then back off to the exact point where the tone disappears.
3. Always ground balance your CZ-21 in the areas you intend to search, whether it's on land or underwater.

NOTES:

1. If you get an audio response as you first lower the coil with the GROUND control at "10," you're probably over a piece of metal. Move and try again.
2. If you get a sudden bell tone that is not preceded by an increasing audio response as you lower the coil, you're probably in some very highly mineralized soil or sand. In this case, it's best to use the "bobbing" method.
3. *If you don't get any audio response, or just a very faint one as you rotate the GROUND control from "10" all the way to "0," you're probably in an area where there's very little ground mineralization. Just leave the GROUND control at "10" and begin searching.*

BOBBING METHOD

1. Turn disc knob to "AUTOTUNE", this puts you into Autotune mode. Set the "SENSITIVITY" control so that you just barely hear a threshold hum.
   Hold the search coil 6 to 12 inches over the ground and at least 3 feet away from any metal objects. Do not use the PINPOINT button during any part of this procedure.
2. Lower the coil an inch or two above the ground and then quickly raise it. Note that as you lower the coil, the tone disappears then gets louder as you raise it and finally returns to normal when you stop it 6 to 12 inches above the ground. Conversely, if you set the GROUND control to "1," the threshold hum will get louder as you lower the coil and disappear when you raise it.
3. Your objective now is to adjust the GROUND control so that there is no change, or only a minimum change in the threshold hum, as you move the coil up and down. Start by lowering the GROUND control to "9." Lower the coil and raise it again. One of three things will happen to your threshold hum:
   - **a)** It will fade again as you lower the coil and increase as you raise it. Continue to lower the ground balance setting in small increments until the threshold hum remains the same (or changes very little) as the coil is lowered and raised.
   - **b)** It will get louder as you lower the coil and go silent as you raise it. You have gone past the correct ground-balance setting. Increase the ground-balance level (rotating the control counterclockwise) in small increments until there is little or no change in the threshold level.
   - **c)** The hum will remain the same, or if it changes slightly, the change is the same whether you lower or raise the coil. Your CZ-21 is properly ground balanced, and you are ready to begin searching.

4. With a little practice, you should be able to ground balance quickly by "bobbing" the coil up and down in a continuous movement as you adjust the GROUND control with your thumb.

NOTES:

1. If you get an audio response as you first lower the coil with the GROUND control at 10, you're probably over a piece of metal. Move and try again.
2. If you get a sudden bell tone, not preceded by an increasing audio response, you're probably in some very highly mineralized soil or sand. Instead of lowering the coil to an inch or two above the ground (as in step 2 above), stop just before you hear the bell tone and ground balance as instructed. Maintain that coil height as you search.
3. If you don't get an audio response, or if the hum stays the same no matter where you set the GROUND controls as you bob the coil up and down, you're probably in an area where there's very little ground mineralization. Just leave the GROUND control at "10" and begin searching.
4. Recheck your ground balance occasionally.

SEARCH MODES

Your CZ-21 has two search modes: Target I.D. and Autotune. Both search modes are "motion" modes, meaning the search coil must be in motion to detect a target. Unlike other metal detectors, the discrimination level has little, if any, effect on the depth capability of the CZ-21. Note, however, that the all-metal Autotune mode has a wider search pattern and may detect a little deeper. Depth is also determined by the size, shape and conductivity of the target as well as the sensitivity setting of the CZ-21.

AUTO TUNE MODE

Set the DISC control to AUTOTUNE, for a very sensitive, wide-scan, all-metal, motion search mode. This mode responds to all metal targets and does not have the ability to identify or reject objects.

The Autotune mode is useful in three situations:

1. **Non-Trashy Areas.** The Autotune mode has a wider scan than the I.D. mode, reducing changes of missing good targets. Search in the Autotune mode until you find a target. Pinpoint the target using the PINPOINT button and then switch the DISC control to "0" to identify the target in Target I.D. mode. The DISC control is positioned so that you can switch back and forth between AUTOTUNE and "0" with a flick of your thumb.
2. **Highly Mineralized Soil or Sand**. The Autotune mode is recommended for black and gray beaches or highly mineralized soil. Under these conditions it may be necessary to lower the sensitivity level and sweep several inches off the ground (see the notes on p. 14) Gold nuggets are generally found in highly mineralized soil so this will be the search mode of choice for prospectors.
3. **All Metals Searching.** Evidence recovery teams, archeologists and professional underwater treasure hunters will often opt for the deep search, all-metals Autotune mode.

TARGET I.D. MODE

When the DISC control is set in the 0-6 positions, the CZ-21 has the ability to identify many types of small targets and, depending on the discrimination level, reject or ignore most of them. To better understand just how your CZ-21 responds to different targets, try the following:

1. Scatter some sample targets such as coins, rings, pull tabs, nails and foil on the ground at least 18 inches apart. Include some large targets as well: jar lids, soda cans, etc.
2. Set the DISC control at "0," SENS at "5." Adjust the VOLUME control for a comfortable level when you are over a large target.
3. Ground balance the CZ-21 as in the "Ground Balance" procedure.
4. Hold the search coil about 2 inches above and parallel to the ground and move it slowly back and forth across each sample. Remember, the coil must be in motion to get a response. Keep in mind that for accurate target I.D., the coil center must pass directly over the target.
5. Note the different audio responses over the various targets. Your CZ-21 will respond with a low tone over most iron or steel targets. Pull tabs and foil will give a medium-tone response. U.S. coins give a high tone response.
6. Note that an elongated ferrous object such as a nail will give you a double "beep" as you cross it from end to end, or a single "beep" if you cross its center.
7. The signal from a large or shallow target will overload the circuit, making target identification impossible. The CZ21 indicates this condition with a distinctive bell tone. The overload will not harm the detector; the signal is just too strong for interpretation. If you hear the bell tone, indicating overload, move the searchcoil away from the target. Sweeping at a greater distance may allow for proper target identification.

8. Most silver rings will give a high tone. Most gold rings will fall into the pull tab/foil mid-tone category. This is due to the unavoidable fact that most gold rings are conductively similar to aluminum foil and pull tabs. Some are more closely identical to the U.S. 5-cent piece; however, the CZ-21 does have the unique ability to separate those signals from the aluminum trash signals.

9. Now increase the DISC control to "1." You will find that the CZ-21 rejects the small, iron targets and no longer responds with an audio tone.

10. Continue to increase your DISC control, noting that with each successive step up, more and more targets are rejected. At DISC = "4" for example, a "coins-only' mode will ignore iron, tabs and foil while accepting U.S. coins.

11. The target I.D. decal on the left underside of the control housing graphically displays which items are rejected and accepted at each DISC level. For example, "foil" is placed between DISC = "2" and DISC = " 3." This means that foil is accepted at "2"

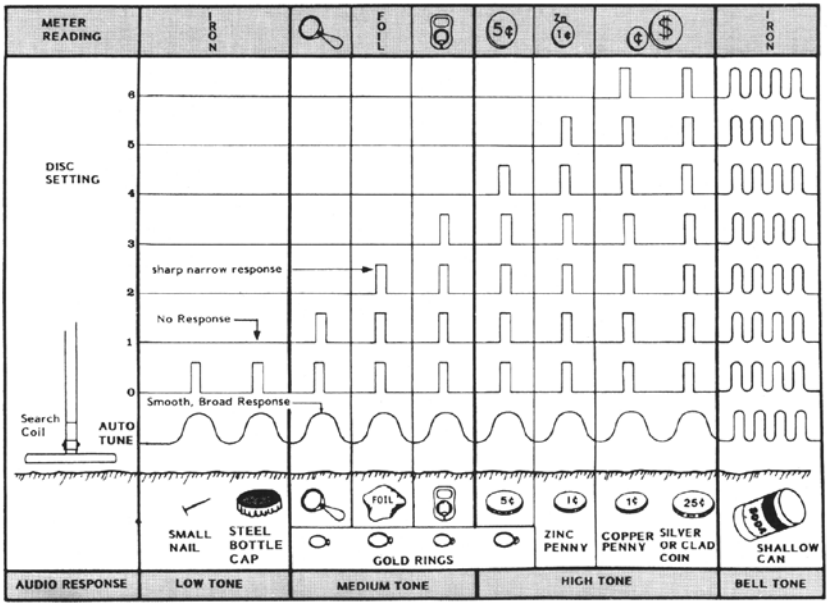


Figure 8. Typical CZ-21 Audio Responses

and rejected at "3."

12. You may expect varying signals over different targets and at different levels of discrimination. Note that as you progressively increase the discrimination level, more and more targets are eliminated.

13. Now switch the DISC control to the AUTOTUNE position and note the completely different kind of response. No tone, just a smoother, solid response over every target.

SEARCHING ON LAND OR SHALLOW WATER

Good search technique is very important to successful treasure hunting.

1. Make sure your CZ-21 is properly ground balanced.

2. Decide which search mode you're going to use. Target I.D. is the recommended starting point with the DISC control set at "4" or Autotune.

3. Set your SENSITIVITY control. Only experience will tell you how to set it in every situation, but you'll probably want to run it as high as you can. Recommended starting point: SENSITIVITY = "5." If you're in the Autotune mode, set it so that you can just barely hear a slight audio hum.

4. Adjust your VOLUME control. Remember that a setting above "5" will amplify the response of faint targets so that they sound like a shallow or large target. Some searchers prefer not to use it above "5" so that the audio response corresponds directly to the depth

and/or size of the target. Recommended starting point: VOLUME = "5," then adjust the volume control for comfort over loud targets.

5. Once the controls are properly set, begin searching by walking slowly and sweeping the search coil in a tight semicircle as shown in Figure 9.
6. Keep the coil parallel to the ground and as close to the ground as practical. This is extremely important for maximum coverage and depth. If you're searching on a lawn, you may set the coil right on the grass and lightly "scrub" it.
7. Overlap your sweeps by at least 50 percent. Remember, your coil's search pattern is conical, and if you don't overlap each sweep you'll miss the deeper targets.
8. Search in a methodical manner. Pay close attention to where you're going and where you've been.
9. Keep the search coil moving at a comfortable rate. Remember that the CZ-21 is a motion detector and responds only when the coil or target are moving (except in the Pinpoint mode.)
10. Take your time. If you walk too fast you can't overlap your sweeps and you'll miss a lot of ground. If you swing your coil too fast you'll lose some sensitivity to deep and/or small targets.
11. Figure 12 on page 20 shows how the CZ-21 search coil pattern is affected by sweep speed, ground mineralization and search mode.

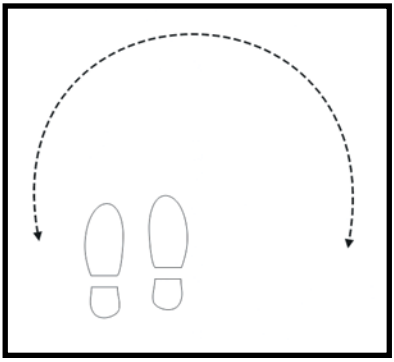


Figure 9. When the stem length is properly adjusted, the CZ-21 is balanced for sweeping a tight semicircle around the operator: wide to the right for right handers, wide to the left for left handers. Be sure to overlap your sweeps.

Impact of sweep speed, ground mineralization, and search mode

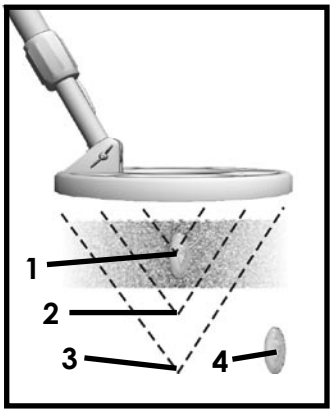


Figure 12. Search coil detection pattern.

1. Minimum depth
- **a.** Very slow or very fast sweep speed
- **b.** Highly mineralized soil
- **c.** Target I.D. search mode

2. Average depth
- **a.** Moderate sweep speed
- **b.** Moderately mineralized soil
- **c.** Target I.D. search mode

3. Maximum depth
- **a.** Moderate sweep speed
- **b.** Non-mineralized soil
- **c.** Autotune search mode

4. Missed target

Many targets well within the range of your CZ-21 will not be detected unless you overlap your sweeps.

SEARCHING UNDERWATER

The CZ-21 is waterproof to 250 feet, and it operates the same underwater as on land. Some differences in search technique should be noted.

1. Tune your CZ-21 underwater on the bottom as instructed on page 6. Many divers prefer to use the Autotune mode, in which case you may want to run your threshold tone slightly higher than you would on land. If you're wearing a hood, you'll probably have to turn the volume control to maximum.
2. Keep the search coil as far away from you and your dive gear as possible. Sweep the search coil back and forth in a wide semicircle in front of you to cover the bottom in a methodical manner.
3. Keep the coil parallel and as close to the bottom as possible. Overlap your sweeps at least 50 percent.
4. Recheck your ground balance every 5 to 10 minutes.
5. Remember, observe all the rules of safe diving.
6. Keep the search coil cable wound snugly around the stem when diving around coral or jagged rocks to keep it from snagging.
7. Divers should make sure the drain holes in the headset are unobstructed. Better yet, wait until you're on the bottom before putting your headset on, and take it off before surfacing.
8. Divers should also keep the search coil at least 2 feet away from their bodies. Metal gear (weights, gauges, tanks, etc.) will be detected by the CZ-21 if held too close.

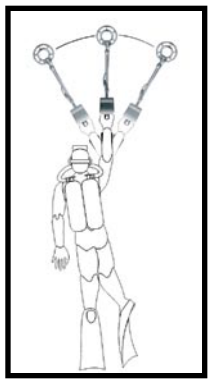


Figure 13. Move slowly, keeping the search coil away from your dive gear and as close to the bottom as possible

PINPOINTING

Target location is quick and easy using the touch pad pinpoint mode. The coil does not have to be moving to get a response in this mode.

1. Whether in Autotune or Target I.D. mode, once the presence of a target is indicated by the "beep-beep" of your CZ-21, simply move the coil away from the target area, and with the coil lightly on the ground or very close to it, press the PINPOINT button.
2. As you bring the coil back into the target area, the audio volume and pitch will increase.
3. When the pitch and volume are at their highest points, stop the coil and move it forward and backward a couple of times, again stopping over the strongest response.
4. Repeat one more time, side to side and front to back, stopping over the spot where you get the maximum volume and pitch.

NOTE: *Large or shallow targets can give a wide signal in pinpoint mode. This can make pinpointing difficult. To pinpoint these large or shallow targets, find the edge of the wide signal in pinpoint mode. While over the edge of the signal, tap the pinpoint button again. This automatically decreases the sensitivity and narrows the width of the pinpoint signal. By repeating this procedure a few times over the edge of the wide signal, you can narrow the pinpoint signal and pinpoint your target.*

TARGET IDENTIFICATION

Target I.D. with the CZ-21 is quick and simple. Just keep in mind these two rules:

1) You must be in the Target I.D. mode.

2) The center of the search coil must pass directly over the target.

It's always a good idea to walk slowly and overlap your sweeps. But if you're searching a large expanse of new territory, you may want to walk a little faster and not overlap your sweeps as much until you start making a few good finds. Then, slow down, overlap your sweeps and cover every inch of ground.

In trashy areas, to reduce the "masking" effects of trash on nearby good targets, use a shorter and slower sweep pattern.

1. Once you've located a target, pinpoint its exact location as in the "Pinpointing" procedure. *Since accurate I.D. is dependent on accurate pinpointing, it is recommended that you tap the PINPOINT button rather than try to pinpoint your target in either the Autotune or Target I.D. mode.*

2. Once you've pinpointed your target, tap the PINPOINT button again. If you're searching in the Autotune mode, switch over to DISC = "0." If you are already in the Target I.D. mode, just leave the DISC control where it is.

3. Move the coil just enough, left-right-left, across the target to get a good, solid signal. If you no longer get a signal after you've pinpointed your target, then you're over something that falls below the DISC setting you've chosen, and your CZ-21 is rejecting it.

4. Once you've pinpointed your target and you're getting a good, consistent signal, you've identified or at least classified your target. A low tone means your target is probably ferrous. A mid tone indicates a pull tab or foil, and the high tone indicates a U.S.

coin.

5. The DISC control provides increments of rejection and identification within the mid- and high-tone target classifications. Take a look at the target I.D. decal on your control housing to see what gets rejected at which DISC point.

6. If you're getting a high-tone response for example, you may well be over a U.S. coin. If you want to know what kind of coin it is, advance the DISC control to "5." You know from the I.D. decal that if you lose the signal your target is probably a nickel (or something conductive and very similar). If you don't lose it, go up to "6." If you lose it at "6," your target may well be a U.S. zinc penny. If you still get a signal, your target, if it is indeed a coin, will probably be a copper penny, an older silver coin or a clad coin. Most other small targets will be ignored.

7. The same is true of the mid-tone targets: Round pull tabs are rejected at "2," foil at "3" and rectangular tabs at "4." If, for example, you're looking for gold rings in an extremely trashy area, you have the ability to reject at least some of the trash (like iron, round tabs and foil) and still get those rings falling into the rectangular tab and all coin categories. Of course you'll have to dig rectangular tabs as well.

8. Your CZ-21 will correctly identify most of the targets on your I.D. decal most of the time, but it can be fooled. Large targets, uneven ground mineralization, good targets lying next to bad targets, deep targets, all of these and more are sources of error. Remember, the CZ-21 is designed to I.D. small, coin-sized targets only, and even some of these may be deep enough, bent, damaged, or corroded enough to give a false signal.

9. You should also realize that there are many good targets which are not classified by the CZ-21, as mentioned earlier. Gold rings, for example, may fall into any category except iron. Many foreign coins, especially the new ones, may I.D. as foil or pull tab. Gold nuggets, depending on their size and shape,

may fall into just about any category, the smaller nuggets falling on the lower half of the scale. So if you're not just looking for U.S. coins, you should test some sample targets to determine what level of discrimination you want to work at and what targets you want to dig.

10. Here's a quick and easy way to tell the difference between a small, shallow piece of foil and a gold ring (or other possibly good target) without digging: If you get a good solid "FOIL" I.D., set the search coil down close to the target and then whip it rapidly across the target just once with what can best be described as a flick of the wrist. If the target disappears, it's probably a small, shallow piece of foil. If not dig it up it could be that gold ring you're looking for. Practice this over some foil until you get the hang of it.

11. Don't be afraid to turn your sensitivity down. True, the higher the sensitivity, the deeper your CZ-21 will go, and the more you'll find. But that's only under optimum conditions. If you're getting a lot of false signals caused by electrical interference, ground mineralization or dense trash, lower your sensitivity. If you have to back it down to "4," "3" or even "2" to eliminate the falsing, do it. That's what your SENSITIVITY control is for. You'll be surprised at how much you might find in an area that would otherwise be unsearchable at high sensitivity levels.

12. Set your discrimination at an appropriate level. If there's very little trash in the area, set it low, say at iron discrimination, and dig every good signal. If there is a lot of trash present and you're mainly interested in coins, set the discrimination level high. You may even want to sacrifice nickels and zinc pennies in extremely trashy areas. If you're looking for gold rings, relics, artifacts, or small ancient coins, you'll have to set your discrimination level low. The best way to find out how low is to bury some sample targets or just dig everything for awhile until you get

a feel for which target classifications will be the most productive.

13. Look for repeatable signals and don't waste time on disappearing or one-way signals. If you hear a good beep but can't repeat it when you go back over the target area, or if it beeps in only one sweep direction, it's probably a piece of trash - something below your discrimination setting.

14. If you're in a relatively non-trashy area, try searching in the Autotune mode and then identifying your targets by switching to DISC = "0." You'll find more and deeper targets this way. *And you'll eliminate almost all false signals.* If you're having any difficulty pinpointing or identifying a target in the I.D. mode, don't waste any more time. Push the pinpoint button for quick pinpointing, then release it for accurate I.D.

15. If your target disappears when you go into the Pinpoint mode, you've probably tuned it out by pressing the button too close to the target or over another piece of metal. Try again, this time tapping the PINPOINT button over another piece of ground.

16. Don't waste a lot of time digging holes for targets you can't find. If your hole keeps getting deeper and wider, cover it up and go on. You may be over a buried pipe or some other large deep target.

TARGET RECOVERY

Once you've identified and pinpointed a target, your objective is to recover it quickly and neatly, leaving virtually no trace of your excavation. There are almost as many ways to do this as there are treasure hunters. Whatever works for you is good enough as long as you don't break any laws, leave uncovered holes or damage the environment either on land or underwater.

Generally speaking, divers and beachcombers do little, if any, damage to the environment while recovering small targets. However, if you plan to use your CZ-21 on lawns or in parks, your target-recovery method can be very important.

POINTS TO REMEMBER

1. When in doubt, dig. If your CZ-21 can't quite decide whether a target is good or bad, dig it up.
2. Good things often come in two's. Or even three's. Once you've recovered a good target, always recheck the hole for a second signal and carefully search the immediate area by walking slowly around the hole two or three times, overlapping your sweeps in an ever-widening circle. *Always dig every suspicious sound in the vicinity of a good find.*
3. Recheck your hole even if your find was trash. Good targets are often found beneath bad ones.

Whichever method you choose, remember that responsible treasure hunters take pride in their ability to leave soil and vegetation intact and undamaged. If you don't want to see your right to treasure hunt restricted or even eliminated by government legislation, fill those holes and leave your hunting areas in better shape than when you arrived!

RECOVERY TOOLS

1. Sand scoops designed especially for beachcombers and shallow-water treasure hunters are available at metal detector outlets.
2. Divers use a variety of recovery tools, depending on the condition of the sea bed or lake bottom. A sturdy dive knife will suffice in packed mud or small rocks. Most divers prefer to use their hands in loose sand. Professional treasure hunters often use an air hose fed by a surface compressor to blow away loose sand, gravel or mud.
3. For land recovery, a sturdy hunting knife with a 5-inch blade will suffice in most soils. A high quality, double edged "survival" knife is an even better choice (and more expensive) because it will be almost impossible to bend or break.
   CAUTION: *Using a jack knife without a locking blade is a good way to lose a finger.*
4. A heavy duty, blunt screwdriver is commonly used for shallow targets where digging or "plugging" is objectionable.

FALSE SIGNALS

A "false signal" occurs when a target is incorrectly identified. For example , a small, broken-off piece of pull tab may be identified as a nickel. Or a small, deep coin, especially in mineralized soil, may read "IRON." The more sensitive the metal detector, the harder it is not to have false signals. Your CZ-21 is an extremely sensitive machine, so you're bound to encounter them. Here are some of the most frequent sources of false signals and what to do about them:

1. **Trash:** The most common source of false signals. Large or irregular pieces of trash may give good, consistent, high-tone signals. In this case you'll usually have to dig the target, but with experience you'll be able to eliminate many of the large targets whose size will be obvious when you go into the pinpoint mode. Another false signal response may be a "one-way" or disappearing signal. You'll sweep over the target and get a good signal but nothing on the return sweep. When this happens you're over a target that the CZ-21 can't positively identify due to its size, shape, depth or alloy. The CZ-21 may I.D. it as a coin when swept from one direction and iron on the return sweep.

   If your DISC control is set at "0" you'll hear first a high tone (coin) and then a low tone (iron). Or if your DISC control is set higher, to reject iron, you'll hear the high tone sweeping one way and nothing the other way.

   Quite often the signal will just disappear and you won't be able to find it no matter which direction you sweep. These one-way and disappearing signals are usually trash, and as a general rule you should ignore them. If you have any doubts, tap the PINPOINT button to get an accurate location, and then I.D. the target. If you get a good repeatable tone, dig it. If you still get a one-way signal or it disappears, move on. Also, if your pinpointing location is different than your

I.D. location, your target is probably a piece of iron. Reducing your sensitivity level, taking shorter, slower sweeps, or increasing the discrimination level may reduce the number of false signals caused by trash.

2. **Deep Targets:** Deep targets, just barely within the range of the CZ-21, may be misidentified. For example, a deep coin may I.D. as iron, or a deep piece of iron may I.D. as a coin. There's not much you can do to avoid this other than to use your pinpoint mode to ensure that you are exactly centered over the target. Or you may reduce your sensitivity level so you just ignore the very deepest targets.
3. **Electrical Interference:** Constant chatter caused by radio/TV stations, power lines or nearby detectors operating at one of the CZ-21 search frequencies. The best solution is to move away from the source of the interference. You may also try one of the following:
   a) switch to the Autotune mode.
   b) reduce your sensitivity level.
   c) slow down your sweep speed.

   If the interference is only minimal and you wish to continue searching anyway, test your CZ-21 over a known target to make sure it's operating properly. Inside some buildings, electrical interference may be so bad that you'll have to go outside just to bench test your CZ-21.
4. **Highly Mineralized Soil:** May cause a bell tone response or constant false signals. Check your ground balance (See page 11). Try lowering the sensitivity and/or increasing the discrimination level. Search in the AUTOTUNE mode. Re-ground balance using the "bobbing" method (See page 13). If all else fails, raise the search coil just high enough for the false signals to disappear and then sweep at that constant height.
5. **Black Sand:** Same as Highly Mineralized Soil above.

6. **Wet Salt Water Sand:** Your CZ-21 should be able to handle most wet sand easily unless it's black. See Black Sand above. You should able to reduce the number of false signals caused by salt water by lowering your sensitivity and making sure you are ground balanced properly.
7. **Hot Rocks:** Some rocks, by virtue of their high mineral content, will be seen by metal detectors as a metal target. In the Autotune mode, the CZ-21 will respond to most hot rocks. Prospectors must learn to distinguish between hot rock and nugget sounds. In the target I.D. mode, certain types of hot rocks will be automatically rejected at DISC = "0" and virtually all other hot rocks will be identified as iron or rejected at DISC = "1."
8. **"End of Swing:"** Silent search motion detectors often give false signals at the edges of the search pattern, just as the coil stops and begins accelerating back toward the operator. If this is a problem, try one or more of the following:
   - **a)** Keep your sweep smooth, slow and low to the ground.
   - **b)** Check your ground balance.
   - **c)** Lower your sensitivity.
   - **d)** Make sure your search coil is properly secured and the cable connector is firmly tightened.
9. **Digging Tool:** If you're carrying a metal sand scoop, digging knife, or screwdriver, hold it behind your back or keep it above your waist. Your CZ-21 is sensitive enough to sound off each time you sweep the coil beneath it.
10. **Elongated Ferrous Objects:** If you get two beeps close together and can't find either target, you may be near a nail or some other long, ferrous object. Fortunately, in most cases your CZ-21 will identify these objects correctly. In all cases, the target will be between the beeps, or if you sweep at right angles

to your original direction, you'll receive a single beep directly over the target.

a) Shallow coins (at or near the surface) or coins on edge will give a double beep: one on either side of the coin, just like a nail. Like the nail, the coin on edge will give a single beep directly over the target if you sweep at right angles to your original position.

b) A coin lying in the ground at an angle (as shown) may give a single target response but may pinpoint several inches away from its true location. Check around the inside edges of the hole. If you still don't find it, enlarge the hole by a couple of inches.

c) A large, deep target, like a buried pipe or a manhole cover at 2 feet, will often give a good, strong coin signal. If you've dug down a foot and widened your hole several times, give up.

11. Practice! Practice over known targets. Practice ground balancing. Practice pinpointing. Reread the appropriate part of this manual if you're having problems.

BATTERY REPLACEMENT

The CZ-21 is powered by four, 9-volt transistor batteries located in the rear section of the control housing. The batteries are sealed off from the electronics so that accidental water leakage into the battery compartment will not damage the circuitry. To replace the batteries:

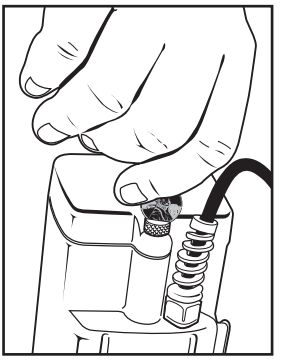
1. Remove the battery door by partially unscrewing the two knurled thumb screws. The knurled knobs are "captive screws" and are not to be completely removed from the battery door.
2. Remove the battery pack from the Control Housing. It's not necessary to disconnect the battery lead connector. Be very careful not to put any undue strain on the battery leads.
3. Remove the batteries from the battery pack, and install fresh alkaline batteries. You may also use rechargeable Nicads, but expect about half the battery life.
4. Insert the battery pack into the Control Housing. With your finger, push the top of the battery pack (with the leads) into the Control Housing first, then let the bottom follow.
5. Make sure the O-ring and both sealing surfaces are clear and free of debris before reinstalling the battery cover. **THIS IS EXTREMELY IMPORTANT!.** *See page 36 for gasket orientation.*
6. Finger tighten the thumb screws, then carefully tighten again 1/4 turn with a coin or screwdriver.

VERY IMPORTANT

Follow these instructions carefully to avoid getting water in the battery compartment.

1. Tuck in the wires. Do not pinch them in the seal when closing.

2. The battery door will capture the battery holder and self-center it as you install the door.



3. Tighten the knobs SECURELY.
- **a.** Use a coin.
- **b.** Tighten by hand FIRMLY. Use maximum MANUAL force.
- **c.** Do Not use a tool.
- **d.** Do Not use a screwdriver.

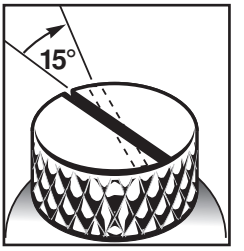
Torque Specification is 8 in-pounds.

4. If you have removed the gasket, see page 36 for installation instructions.
An improperly installed gasket = a water leak!

5. Submerge the detector in water for 1/2 hour.
- **a.** Remove from water.
- **b.** Dry off the detector
- **c.** Remove the battery door
- **d.** Verify that no water has entered.

This step is necessary to insure that you are applying enough force to the screws.

6. <u>If you cannot tighten the screws</u> securely by hand, then use a screwdriver.
- **a.** Tighten the screw a maximum additional rotation of 15° beyond the hand-tightened position.



7. Lithium grease is installed between the contact surfaces of the thumb-screw and insert in the case.
- **a**. Do not wipe off the grease.
- **b**. With usage, the grease may wear off.
- **c.** Without grease, the thumb-screw may seize up after tightening. If this happens, reapply a small amount of lithium grease between the contact surfaces.

MAINTENANCE

Your CZ-21 doesn't require a lot of care. It's built with high-quality materials, and it's waterproof to a depth of 250 feet. But there are a few things you should do to keep it in peak operating condition.

Handling

1. Do not drop your detector.
2. Do not drop the housing directly on to the knobs. **Damage caused by impact is not warrantable.**

Storage

1. If you're not going to be using it for awhile, take the batteries out. Acid damage caused by leaking batteries can be severe. **Damage from battery acid is not warrantable.**
2. Avoid extreme temperatures. Don't leave it inside a closed car sitting in the sun or even worse, in the trunk of a car.

Cleaning

1. Sand and dirt between the coil "ears" and lower stem will grind away the ears and stem.
2. The headphone ear pads may be removed, rinsed and squeezed out to remove any sea water salt build up.
3. Sand, silt or fine dirt between the upper and lower stems will cause the lower stem to freeze up. Rinse frequently.
4. Rinse the lower area under the two knobs on the control panel thoroughly after use in salt water.
5. Always clean and dry the area around the battery cover seal before opening.

Battery Compartment

1. Remove the battery cover and check for water after each use in water.
2. Keep the sealing surfaces of the battery cover and control housing clean and free of scratches and nicks. Remove and clean the neoprene gasket frequently. Lubricating the gasket is not recommended. Clean the gasket with mild soap and warm water only. Do not use petroleum jelly or silicone grease at any time.
3. Re-install gasket correctly (see illustration next page)

BATTERY DOOR GASKET: ORIENTATION

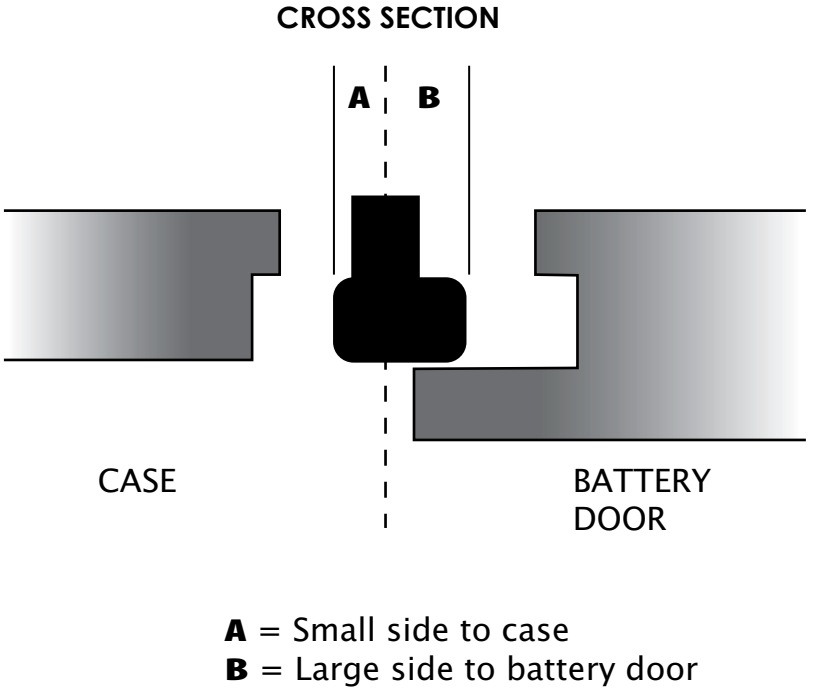


Figure 16. Battery door gasket installation

The rubber gasket, which fits into the battery door, must be installed **with the larger protrusion (B), toward the battery door.**

If you remove the gasket for cleaning, re-install correctly. Improper installation will result in leakage.

Where To Use Your Metal Detector In The U.S.

National Forest and Federal Lands—Metal detecting is allowed only by special permit acquired from the federal government. Each area has a district office.

Corps of Engineers, Lakes, Shorelines and Lands—Permission has been granted only on predisturbed sites, such as beaches and attached swimming areas. New Corps lakes and lands must be okayed by the main office of the Army Corps of Engineers. Each area has a district office.

State Parks and Lands—Some state parks are open to metal detecting, but some are not. Always check with the park ranger before attempting to use your detector.

Bureau of Land Management (BLM) Lands—Some areas are open for metal detecting, and some are not. Always check with the district office.

City or County Park Lands—Most are open to metal detecting unless notice is given by a sign or city ordinance. When in doubt, always check with the city's Parks and Recreation Department.

Public School Grounds—Most are open to metal detecting unless notice is given by a sign, city ordinance, law enforcement official, or school employee. You should always check with the school office first.

Privately Owned Lands (Private Property)—Permission required. It is always best to have the permission in writing.

Historically Marked Lands or Sites—Metal detecting is not allowed. Don't even think about it.

SPECIFICATIONS

Length ..... Extended ..... 50"
..... Collapsed ..... 30"

Weight	8" Coil	10.5"	Coil 5"
Complete (with headset)	.....5 lb.	...11 oz. 6 lb.	...1 oz. 5.4 lb.
Handle and Search Coil	..... 2 lb.	...6.9 oz. 2 lb.	...12.9 oz. 2.1 lb.
Control Housing	..... 2.8 lbs.		

Frequency ..... 1. Dual, VLF Search 5 KHz and 15 KHz
2. Audio Target Response
Iron I.D. ..... 200 Hz (Low tone)
Foil and Tab I.D. ..... 450 Hz (Mid tone)
Coin I.D. 1 KHz (High tone)
Autotune ..... 500 Hz - 1 KHz (VCO)
Pinpoint ..... 500 Hz - 1 KHz (VCO)

Operating Modes
1. Autotune ..... VLF-Motion, all-metal with threshold tone
2. Target I.D ..... VLF-Slow Motion, Silent Search Discrimination
3. Pinpoint ..... VLF, All-Metal, No Motion

Search Coil..... Type ..... Concentric, Co-Planar
Diameter ..... 8", 10.5" or 5"
Shielding ..... 100% ESI
Interchangeable ..... No

Headset..... Waterproof, Piezo Electric
Interchangeable ..... No

Ground Balance ..... Touch Pad, Manual or "Preset" Control Markings
Hipmountable Control Housing..... Yes
Salt Water/Fresh Water Operation ..... Yes
Land Operation..... Yes
Submersible..... to 250 feet

Batteries..... Separately Sealed Compartment..... Yes
..... Type..... (4) 9V Alkaline
..... Life Alkaline ..... 35-55 hrs.
..... Nicads 10-20 hrs.

Operating Temperature ..... 32° - 110° F

Faint Target Audio Boost .... Yes
Manual Threshold Tuning.... In Autotune Mode
Target I.D. ..... Three tones plus bell tone for large, shallow targets, plus 7 preset DISC. control settings

Notes:

1. Subject to improvement or modification without notice.
2. Approximate.
3. Pulsegate Unipolar Audio Processing. Advanced Fisher circuitry which allows silent operation below "audio threshold tone" with no loss in sensitivity.
4. The CZ-21 is a "motion" detector while in the search mode. The search coil must be moving at least slightly to detect a target.
5. Electro-Static-Insulated to eliminate certain types of false signals.

TREASURE HUNTERS' CODE OF ETHICS

LET'S PRESERVE OUR TREASURED SPORT!

Laws governing the use of metal detectors are becoming more and more common. In many countries, the use of metal detectors is illegal or severely restricted. Don't let this happen in your area.

ALWAYS get permission to hunt on private property.
ALWAYS leave a site cleaner than you found it. Take at least some trash with you or, if you can, take it all.
ALWAYS fill in your holes neatly whether you're in a city park or in a remote wilderness. Leave the land as it was before you disturbed it.
ALWAYS obey all laws relating to treasure hunting.
ALWAYS return valuable property if you can locate the original owner.
ALWAYS do whatever you can to give the hobby of treasure hunting the good image it needs and deserves.

2-Year Limited Warranty

The CZ-21 metal detector is warranted against defects in materials and workmanship under normal use for two years from the date of purchase to the original owner.

Damage due to neglect, accidental damage or misuse of this product is not covered under this warranty. Decisions regarding abuse or misuse of the detector are made solely at the discretion of the manufacturer.

Proof of purchase is required to make a claim under this warranty.

NOTE TO FOREIGN COUNTRY CUSTOMERS
This warranty may vary in other countries, check with your distributor for details.
Factory warranty follows the channel of distribution.
Warranty does not cover shipping costs.

Liability under this Warranty is limited to replacing or repairing, at our option, the metal detector returned, shipping cost prepaid, to Fisher Labs. Shipping cost to Fisher Labs is the responsibility of the consumer.

To return your detector for service, please first contact Fisher Labs for a Return Authorization (RA) Number. Reference the RA number on your package and return the detector within 15 days of calling to:

Fisher Research Labs, Inc.
1465-H Henry Brennan Dr.
El Paso, TX 79936
Phone: 915-225-0333 ext.118

Warranty coverage does not include the cost of transporting the detector back to an owner who is located outside of the United States of America.

NOTE TO FOREIGN COUNTRY CUSTOMERS
This warranty may vary in other countries,
check with your distributor for details.
Factory warranty follows the channel of distribution.
Warranty does not cover shipping costs.

ATTENTION:

Damage do to neglect or accidental damage is not warrantable

IMPACT WARNING:

Impact to the front knobs, the front edge, or the case will cause the front plate to fracture, resulting in leakage.

Such damage is not warrantable.

CABLE STRESS:

If you hip-mount the CZ-21, leave slack in the cable so as not to pull cable taunt at end of sweep. Damage to coil cable at housing connection **is not warrantable** if a result of repetitive, excessive stress.

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